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The Moderating Effect of the Listing Sector on the Relationship Between Capital Structure and Financial Distress of Non-Financial Companies Listed in Kenya

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Abstract
This paper sought to investigate the moderating effect of the listing sector on the relationship between capital structure and financial distress of listed non-financial firms in Kenya. In total, non-financial firms are listed across seven sectors depending on their primary commercial activity. Capital structure was operationalized by total debt, long-term debt and short term debt financing. The degree of financial distress was measured using the Altman's Z-score index as reviewed for the emerging markets. Secondary data from audited and published financial statements was collected for the 40 listed non-financial firms for 10 years between 2007 and 2016. The study estimated the specified panel regression model for fixed effects as supported by the Hausman test results. Feasible Generalized Least Squares (FGLS) regression results revealed that the listing sector has a significant moderating effect on the relationship between capital structure and financial distress of non-financial firms. On the basis of these empirical findings, the study recommended that managers of listed non-financial companies should always consider the sector-specific factors in making leverage choice decisions for their entities.
Keywords: Capital Structure, Financial Distress, Listing sector

1. Introduction

Financial distress is a common phenomenon within the corporate sector in many countries. According to Andrade and Kaplan (1998), financial distress is a situation where a firm is unable to meet the financial obligations as they become due or does so with difficulties. The net effect is that the survival of financially struggling corporations is significantly compromised and in extreme cases may result in bankruptcy. According to Mwangi, Muathe, and Kosimbei (2014) such an eventuality does not only erode investors' confidence on the capital market but also culminate in loss of shareholders' wealth.

Empirical research in this domain has attributed corporate financial distress to varied factors such as inept corporate governance, severe competition for markets and factors of production as well as adverse economic performance (Outecheva, 2007). Besides these factors, literature on financial distress prediction has identified capital structure as a significant determinant of corporate financial distress (Altman, 2000; Ohlson, 1980). Capital structure is defined as the manner in which firms employ one form of financing in place of the other with regard to the dichotomous sources of debt and equity(Pandey, 2009). According to Baimwera and Muriuki (2014), high degree of financial leverage inadvertently exposes corporations to higher levels of financial risk which often result in financial distress. Further, Muigai (2016) observed that excessive employment of debt capital to finance corporate operations has a negative and significant effect on financial distress of non-financial firms listed in Kenya. Similar studies undertaken within the Asian and Latin American economies have provided similar conclusions (Chen, 2004; Gupta, Srivastava, & Sharma, 2014).

A review of literature on corporate financing has nonetheless postulated listing sector as an important determinant of corporate financial distress. Specifically, Alkhatib (2012) noted that analyzing corporate financial distress would not be complete without considering the environment within which the firm operates. In qualifying this statement, the authors stated that firms normally face varying economic, cultural and sectorial dynamics all of which are crucial in determining their long run financial stability. The importance of sector variable in determining corporate financial distress was further emphasized by Sabido and Mulato (2006) whose study analyzed growth in profit margins of listed firms in Eastern Africa. The study revealed that movements in profit margins of firms operating within similar sectors were almost level. Further, Schoubben and Van Hulle (2004) observed that sector-specific factors play a crucial role in determining their leverage behavior.

The insight provided by these studies therefore offered the motivation to undertake this study that is aimed at examining the moderating effect of the listing sector on the relationship between capital structure and financial distress of non-financial firms listed in Kenya. Essentially, the study is predicated on establishing whether or not the studied non-financial firms exhibit analogous financial distress patterns depending on the way they are financed, their listing sectors notwithstanding. The study measured capital structure using the ratios of total debt to total capital as well as the proportions of long term and short term debt in aggregate gearing levels. In addition,

the study adopted the Altman's Z-score of financial distress as reviewed for emerging markets as the proxy for the degree of financial distress.

2. Literature Review

Alkhatib (2012) noted that analyzing corporate financial distress would not be complete without considering the environment within which the firm operates. In qualifying this statement, the authors stated that firms normally face varying economic, cultural and sectorial dynamics all of which are crucial in determining their long run financial stability. The importance of sector variable in determining corporate financial distress was emphasized by Sabido and Mulato (2006) whose study analyzed growth in profit margins of listed firms in Eastern Africa. The study revealed that movements in profit margins of firms operating within similar sectors were almost level. Further, Schoubben and Van Hulle (2004) observed that sector-specific factors play a crucial role in determining their leverage behavior.

Although finance and economics scholars have agreed that industry-specific factors are critical in determining the performance of firms, studies have provided conflicting results on how these dynamics alter the effect of capital structure on corporate financial distress. In their study of 101 Australian firms selected from manufacturing and investments sectors, Akhtar (2005) sought to determine whether the effect of financial leverage on firm performance is similar across the sectors. Debt to total assets ratio was used as a proxy for financial leverage while EBIT represented profitability. Upon controlling for firm size effect, the study found a negative and statistically significant relationship between debt and corporate performance among firms selected from both sectors. The study therefore concluded that industry dynamics did not influence the leverage-profitability relationship. The findings of the study were in concurrence with those of Amjed (2007) whose study compared the effect of debt on corporate financial distress among firms listed in textile and energy sectors in Pakistan. In the study, the ratio of total debt to total equity represented the level of borrowing while financial performance was measured by use of EPS. The results of the study indicated a negative and significant relationship between the two variables in both sectors.

However, in a similar study carried out among firms listed in different sectors in JSE, South Africa, Rayan (2010) found that the effect of leverage (debt) on financial distress of firms differed across the sectors. In the study that used both random and fixed effects, debt-equity ratio was used as a measure of leverage while EPS proxied corporate financial distress. He attributed this variance to the behavior of firms listed in capital-intensive sectors such as construction and manufacturing to use more debt than equity to finance their assets; hence exposing themselves to risks of financial distress. The findings from this study reflected those by Phung and Le (2013) who undertook a study aimed at comparing the effect of leverage (debt use) on financial distress of 33 and 42 firms listed in Vietnam's manufacturing and services sectors respectively. The study results revealed that despite the effect of debt financing being adverse in both cases, the effect was significant among firms listed in manufacturing industry while it was insignificant in services sector. The authors attributed this difference to the preference for debt capital by manufacturing-oriented firms as compared to those in services sector.

With regard to debt maturity, authors have presented mixed findings on how the effect of long term and short term debt on financial distress of firms varies across the sectors. In a study of how debt structure affected financial distress of 20184 Ukrainian firms listed in seven sectors over 2001-2010, Salim and Yadav (2012) found that use of long term debt positively affected the financial distress of firms listed in construction, petroleum and manufacturing sectors. However, firms listed in commercial and services sectors showed a negative relationship between the two variables. The findings of this study agrees with those of Onaolapo and Kajola (2010) whose study of the firms listed across 26 sectors in Nigeria stocks Exchange showed that the effect of long term and short term debt on financial distress of firms varied from one sector to the other. The authors attributed the variations to the suitability of different sources of debt capital to finance specific aspects of firm operations.

The results of the cited studies however conflicts with those by Chowdhury and Chowdhury (2010) whose study of 171 firms listed across 9 sectors in Bangladesh showed that the relationship and significance between debt maturity and financial distress of firms remained the same across the sectors. The findings mirrors those by Huang (2006) who examined the relationship between debt maturity and the growth rate of 1216 firms listed in six different sectors in China over the 10 year period 1994-2003. The study used both the book long term debt ratio, and market long term debt ratio to proxy debt maturity while earnings-price ratio was used to represent growth. The empirical results showed that in all sectors, long term debt had a positive and significant influence on growth of firms.

Empirical studies have also derived varying results on how sector-specific factors influence the manner in which different sources of equity structure affects the financial distress of corporations. While some studies have shown that this relationship remains unchanged from sector to sector (sector-specific dynamics are not important), other authors have provided evidence that the manner in which different sources of equity financing affects financial distress of firms differs from one sector to another.

In a study that sought to evaluate how sector-dynamics influences the effect of leverage on corporate growth among the Malaysian firms, Salim and Yadav (2012) tested how use of both internal and external equity financing affected stock prices of the firms listed in manufacturing, investments and energy sectors. The study found that use of internal equity had a positive and significant effect on stock price movements of firms listed across the three sectors. However, the study found that the effect of external equity differed from sector to sector; with the effect being negative among firms operating within manufacturing and energy sectors and positive among firms in investments sector. The findings of the study concurred with those by Wuxiang and Yong (2001) whose similar study of Korean firms listed in different sectors found that the effect of equity structure on corporate financial distress was different across the sectors.

The findings of these studies however differed from those by Kapopoulos and Lazaretou (2007) whose study analyzed the effect of IPO financing on liquidity situation of firms listed across 4 sectors in Athens Securities Exchange (Greece). The study revealed that over the study period of five years, the relationship between IPO financing and distress of the firms as measured by cash flow for operations and net working capital ratio was negative and significant across all the sectors. The authors therefore concluded that the pecking order theory of capital structure was applicable in all sectors. These findings were in agreement with those by Frank and Goyal (2003) that sought to test the validity of pecking order hypothesis of capital structure on American firms listed across different sectors found that the theory applied uniformly across the sectors.

As evidenced by the aforementioned studies, empirical literature on how listing sector moderates the relationship between capital structure and financial distress has produced mixed results and is therefore not clear. While some studies have shown that firms listed in some sectors are more likely to suffer financial distress due to their high appetite for debt financing, other studies have postulated that the listing sector does not affect the relationship between capital structure and financial distress. It is on the basis of these conflicting findings that this study is undertaken.

3. METHODOLOGY

3.1 Research Design

The study employed panel quantitative research design. This research design was preferred because the data used in the study comprise of ratios that have been transformed into panels. The research design suited the study by providing both the cross-sectional and longitudinal characteristics of the units being studied (Gujarati, 2003).

3.2 Study Population

The population of the study comprised all the non-financial companies listed in Kenya's Nairobi Securities Exchange during the 10 years period to December 2016. In total, 40 non-financial firms were enlisted in the NSE. According to Mugenda and Mugenda (2003), a complete enumeration of units of research interest (census) is preferred where the population is small and manageable. Further, this method enhances validity of the collected data by eliminating sampling errors (Saunders, Lewis, & Thornhill, 2009). The study however excluded firms that were listed within the banking and insurance sectors. This is because these firms are associated with tight regulatory framework with regard to capital holding and liquidity operations. As observed by Mwangi et al. (2014), this heterogeneity made it difficult to conduct hypothesis testing for the study.

3.3 Data collection

The study used secondary data that was extracted from audited financial statements and annual reports of individual non-financial firms during the ten years period (2007 – 2016). The data obtained for all variables in each firm was organized in panels. According to Baltagi, Bratberg, and Holmås (2005) Panel data is suitable for longitudinal analysis because it provides both the time and cross-sections dimensions.

3.4 Data Analysis

The relevant data was transformed into ratios for the study variables in each firm for every year using Microsoft Excel program. Descriptive statistics such as measures of central tendency and measures of dispersion were used to summarize and profile the pattern in each firm. In addition, panel regression analysis using Stata Version 11 was conducted to establish the nature and significance of the relationship between independent variables and dependent variable under each sector. Significance of individual explanatory variable on the dependent variable was carried out using t-test at 95% confidence level. Joint significance of the regression model was performed using the F-test.

3.5 Measurement of study variables

The table below shows how the variables used in the study were measured and operationalized

Table 3.1: Measurement of Study Variables

Variables	Measurements	Notation
Independent Variables		
Financial Leverage	Total debt/Total capital	TD
Long term debt	Total Non-current liabilities/Total debt	LTD
Short term debt	Total Current liabilities/Total debt	STD
Moderating Variable		
Listing Sector	Dummy, taking value of 1 if firm is listed within the sector and 0 otherwise	D
Control Variable		
Firm Size	Natural logarithm of total assets	FZ
Dependent Variable		
Financial Distress	The Z-score index of financial distress as determined from the Altman's (1993) Model for the emerging markets	

$$Z - score = 3.25 + 6.56x_1 + 3.26x_2 + 6.72x_3 + 1.05x_4$$

Where:
Z = Financial distress index (emerging market score), X_1 = Net working capital/Total assets, X_2= Retained earnings/Total assets, X_3 = Earnings before Interest and Taxes/Total Assets, X_4= Book value of equity/Book value of total liabilities
Zones of discrimination:
Z > 5.85: Safe zone, 4.15 <Z <5.85: Gray zone, Z <4.15: Distress zone. *Source: Altman & Hotchkiss (2006, pp. 267-8)*

3.6 Empirical Model Specification

The study estimated the following two panel regression models to determine both the primary and moderating effects of listing sector. Equation 1 was used to estimate the primary effects of capital structure (without moderation) while Equation 2 estimated the moderating (interaction) effects of the listing sector in the capital structure.

$$FD_{it} = \beta_0 + \sum_{i=1}^{3} \beta_i X_i + \mu_{it} \quad \ldots\ldots(1)$$

$$FD_{it} = \alpha_0 + \sum_{i=1}^{7} \alpha_i X_{it} + \sum_{i=1}^{7} \beta_i (X_{it} * D_i) \sum_{i=1}^{1} \theta_i Z_{it} + \mu_{it} \quad \ldots\ldots(2)$$

Where: FD_{it} is the degree of financial distress, β_0 is the intercept term, β_i are the regression coefficients of the explanatory variables, θ_i are the coefficients of the moderating variables, X_{it} is a vector of explanatory variables and μ_{it} is the error term (the time-varying disturbance term is serially uncorrelated with mean zero and constant variance).

4. RESULTS AND DISCUSSIONS

4.1 Descriptive statistics

Table 4.1: Summary statistics

Variables	Mean	Std. Dev.	Median	Max	Min	Skewness	Kurtosis	Count
Z-score (FD)	7.851	3.008	7.445	19.423	-1.512	0.825	4.797	367
Total debt	0.451	0.171	0.441	0.882	0.068	0.090	2.211	367
Long term debt	0.396	0.284	0.361	0.964	0.000	0.207	1.694	367
Short term debt	0.604	0.284	0.639	1.000	0.036	-0.207	1.694	367
Firm Size	15.333	1.685	15.207	19.056	10.956	-0.024	2.707	367

Table 4.1 shows that non-financial firms had an average financial distress index of 7.85; which indicates a relatively financially sound crop of firms. The standard deviation of 3.008 indicates a high variability on the degree of financial distress among firms. This is confirmed by the wide range between the maximum and minimum Z-score of 19.423 and -1.512 respectively. The results further shows that non-financial firms employed 45% debt capital on average to finance their assets. This indicates a modest gearing position by the firms with a relatively low variability. This could be attributed to the high cost of borrowing as a result of prevailing high interest rates in Kenya.

The results further indicate that during the period of study, the firms had approximately 39.6% of their debt portfolio made up of non-current debt with 60.4% constituting current debt. This implies a higher preference for short term debt as opposed to long term debt. This could be attributed to the fact that short term debt is more easily accessible owing to low collateral requirements (Maina & Ishmail, 2014).

Table 4.1 also indicates that listed non-financial firms held an average of Kshs 4.5 billion worth of total

assets; with a minimum of 57.2 million and a maximum of Kshs 188.7 billion. This signifies that the firms were relatively large. Both the Skewness and Kurtosis shows that the data on all variables was nearly normally distributed (at 0 and 3) respectively and hence suitable for further statistical analysis.

4.2 Regression Data Diagnostic tests

To determine the suitability of the panel data for statistical analysis, various tests were carried out on the data collected. The tests that aimed at establishing if the panel data fulfilled the cardinal requirements of classical linear regression analysis included: panel unit root test, test for multicollinearity among independent variables panel-level heteroscedasticity test and serial correlation test. Where violation to these assumptions was detected, appropriate remedies were employed.

4.2.1 Panel Unit Root Test

Panel unit root test was applied on all variables used in the analysis in order to determine whether or not the panel data was stationary. This involved solving for the value of ρ in the general equation:

$$Y_{it} = \alpha + \rho Y_{it-1} \pm \mu_{it} \quad \ldots\ldots (3)$$

Where: t = 1….10 years and i = 40 firms

If ρ = 1, it implied that the observation Y_{it} was dependent on its lag value Yi_{t-1} and hence the data was non-stationary. The converse would be true if ρ<1. The necessity of this procedure was to avoid a situation where the obtained regression results were spurious; hence jeopardizing testing of hypothesis (Granger & Newbold, 1974). The study applied Fisher-type test (with trend) because it has more advantages than other panel unit root tests. The Fisher-type unit root test requires specification of Dickey-Fuller to test whether a variable has unit root.

Table 4.2: Fisher-type (with time trend) unit root test results

Variable	Statistic	P-value
Total debt	185.9272	0.0000
Long term debt	176.2539	0.0000
Short term debt	159.9525	0.0000
Firm Size	125.9606	0.0008
Financial Distress	230.8624	0.0000

H_0: All panels contain unit roots; Significance level: 5%

Based on the results displayed in Table 4.2, the study rejected the Null hypothesis that the panel data contained unit roots at 5% significance level. Effectively, the study concluded that all the variables used by the study did not have unit root and were therefore were used in levels instead of their first difference.

4.2.2 Panel-level Heterescedasticity Test

To test for panel level heteroscedasticity, the study adopted Breusch-Pagan/Cook-Weisberg test for heteroscedasticity. This involved first estimating the specified empirical model by OLS and then running the test against the null hypothesis of homoscedastic (constant) error variance (Torres-Reyna, 2007) . The tests results provided a chi-square distribution value of 26.55 with a corresponding p-value of 0.0000. The results signifies that the chi-square statistic was significant at 5 percent level and hence the null hypothesis of constant variance was rejected. This indicated presence of panel-level heteroscedasticity in the study data as recommended by (Wiggins & Poi, 2001). To correct this violation of classical linear regression assumptions, the study employed the feasible generalized least squares (FGLS) estimation technique instead of the ordinary least squares method.

4.2.3 Serial Correlation Test

To detect autocorrelation in panel data, the study used Wooldridge test for autocorrelation against the null hypothesis that there was no first order autocorrelation. The test results provided F-statistic value of 20.174 at 1 and 38 degrees of freedom. The F-statistic value had a corresponding p-value of 0.0001 indicating that the null hypothesis of no first order autocorrelation was strongly rejected at 5% significance level. The result therefore concluded that the panel data suffered from the problem of first-order autocorrelation. The study remedied this violation of classical linear regression model assumption by employing FGLS estimation technique (Mwangi et al., 2014).

4.2.4 Test for Multicollinearity

Pair-wise correlation was used to examine the level of collinearity present between explanatory variables used in the study.

Table 4.3: Pairwise Correlation Matrix Results

	TD	LTD	STD	SZ	Z-Score
TD	1				
LTD	-0.1759*	1			
STD	0.1759*	-1.0000*	1		
SZ	0.3234*	0.0845	-0.0845	1	
Z-Score	-0.8095*	0.0221	-0.0221	-0.3133*	1

The asterisk * signify significance at 5% level

Table 4.3 shows that the pairwise correlation coefficients between all independent variables were less than 0.8 implying that the variables did not exhibit severe multicollinearity as recommended by (Gujarati, 2003). The perfect negative correlation coefficient between long term debt and short term debt variables (-1.000) indicated severe multicollinearity problem. To deal with this problem, the study dropped each of the highly collinear variable alternately while running the panel regression analysis as recommended by (Gujarati, 2003).

4.3 Panel Model Regression Results

4.3.1 Hausman Specification Test

In order to establish which panel effects (between fixed and random) provided better estimation results for the study, Hausman test was carried out for the specified panel regression model. The test was conducted against the null hypothesis that random effect model was the preferred model. The Hausman test results provided a chi-square value of 6.87 and a corresponding p-value of 0.0761. The result indicated that the chi-square statistic was significant at 5% level. Effectively, the study rejected the null hypothesis that random effects model was appropriate and estimated the panel regression model for fixed effects as recommended by (Torres-Reyna, 2007).

4.3.2 Presentation and Discussion of Results

The study sought to establish how the sector within which individual non-financial firms are listed moderate the relationship between capital structure and financial distress.

Table 4.4: Sector-wise Panel Regression results (with robust std. errors)

Sector	Agriculture	Automobile & Accessories	Commercial & allied	Construction & allied	Energy & Petroleum	Investments	Manufacturing & allied	Overall model
Variable	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)
Constant	15.8827*** (0.000)	16.4829*** (0.000)	14.2753*** (0.000)	16.1638*** (0.000)	12.7588*** (0.000)	9.4450*** (0.002)	13.2111*** (0.000)	16.0445*** (0.000)
Total debt	-16.3618*** (0.000)	-14.8052*** (0.000)	-10.2277*** (0.000)	-13.3909*** (0.000)	-11.7319*** (0.000)	-12.4237*** (0.000)	-9.5572*** (0.000)	-13.4632*** (0.000)
Long-term debt	1.5463 (0.2310)	6.6903*** (0.000)	3.9461*** (0.000)	4.2173*** (0.000)	8.2773*** (0.000)	-2.4583 (0.289)	3.0051*** (0.000)	3.2189*** (0.000)
Firm Size	1.2850*** (0.000)	0.6457* (0.066)	0.6291*** (0.008)	0.994** (0.029)	0.391 (0.256)	-1.4378 (0.134)	0.8565 (0.210)	0.4631** (0.021)
Statistics								
R-Squared	0.7516	0.9796	0.8289	0.7430	0.8089	0.9105	0.8350	0.7906
Rho	0.4899	0.7101	0.8646	0	0.8955	0	0.8143	0.6157
Wald/F-statistic	250.01	222.81	316.87	496.77	150.77	183.06	150.81	784.52
Prob. (Wald-statistic)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

The asterisk ***, **,* represent significance at 1%, 5% and 10% levels respectively

The sector-wise regression results presented in Table 4.4 show that total debt has an adverse and significant relationship with financial distress in all the 7 sectors at 1%, 5% and 10% significance levels. The finding is similar with that revealed by analysis of the general regression model and implies that use of debt by non-financial firms increases their level of financial distress. The result further means that sector-specific factors provide significant moderating effect on the relationship between financial leverage and financial distress of non-financial firms listed in NSE. This finding corresponds with empirical studies by Akhtar (2005) and Amjed (2007) that showed use of debt to be negatively and significantly related to financial distress of firms regardless of the sectors of listing.

The results further show that long term debt has a positive and significant relationship with financial distress across all sectors except investments and agriculture sectors. This result is consistent with that derived from analysis of the overall model. Within the agriculture sector, the coefficient of long term debt, though positive is insignificant at 1%, 5% and 10% levels. This finding signify that during the period of analysis, use of long term debt (debt maturity) did not influence financial distress of firms listed in Agriculture sector. Nonetheless, where it did, the effect was positive. This trend could be attributed to the fact that although a significant portion of leverage among agro-based firms constitute non-current debt, the corresponding interest rates charged by financial institutions are relatively high considering the seasonal nature of their products (Antoniou, Guney, & Paudyal, 2006). The analysis results also show that the relationship between long term debt and financial distress among firms listed in the Investment sector is adverse but insignificant. This essentially signify that debt maturity has no effect on financial distress of investment-based firms; and where it did, the effect was unfavorable. This finding could be attributed to the finding that the capital markets in the emerging markets such as Kenya are normally characterized with volatile returns; which means that financing such trade

by non-current debt that normally require lengthy repayment period may affect the firm negatively (Bitok, Masulis, Graham, & Harvey, 2011).

5. Summary, Conclusion & Recommendations

The study set out to establish the effect of the listing sector on the relationship between capital structure and financial distress of the non-financial firms. The moderation effect was observed by testing the direction, magnitude and significance of the product terms between individual capital structure variables and sector dummies that took a value of 1 if the firm was listed in the sector of interest and 0 otherwise. The analysis results showed that the listing sector had significant moderating effect on the relationship between the components of capital structure and financial distress of non-financial firms listed in NSE. This pattern could be attributed to differences in sectoral dynamics within which non-financial firms operate.

Based on the empirical findings from the study, the study made the recommendation that in choosing the mode of financing to be employed by non-financial firms, corporate managers should consider the factors that are critical in determining the effect of capital structure on financial distress. Particularly, the sector-specific factors should be carefully considered.

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